



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/521,899

01/14/2005

Olivier J. Poncelet

82641JJH

7129

1333 7590 03/21/2008  
EASTMAN KODAK COMPANY  
PATENT LEGAL STAFF  
343 STATE STREET  
ROCHESTER, NY 14650-2201

EXAMINER

HOBAN, MATTHEW E

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

03/21/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/521,899	<b>Applicant(s)</b> PONCELET ET AL.	
	<b>Examiner</b> Matthew E. Hoban	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-23 is/are rejected.
- 7) ☐ Claim(s) 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### Status

Claims 1-8 and 10-24 are pending and presented for examination

Claim 9 is currently cancelled due to amendment.

### ***Claim Rejections - 35 USC § 112***

1. Claims 19-21 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
2. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term “chelating agent” in claims 18-21 is used by the claim to mean “an acidic compound that can be reacted to and adsorbed”, while the accepted meaning is “a compound with at least two functional groups which donate a pair of electrons to the metal, such as = O, -NH<sub>2</sub> or -COO<sup>-</sup>. Furthermore, these groups must be located so as to allow ring formation with the metal.” The term is indefinite because the specification does not clearly redefine the term. Furthermore, the applicant defines acids such as formic and acetic acid as chelating agents. These compounds clearly are unable to chelate, since they have only one functional group. While acetic acid is not able to

Art Unit: 1793

chelate, a compound such as EDTA or ethylenediaminetetraacetic acid would be able to fulfill this purpose. For this reason, the use of the word chelate and chelating agent in the spec and the claims is erroneous and misleading. For the purpose of this examination the examiner takes chelating agent as meaning an acidic compound able to react with and provide surface functionality to aluminum.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-8 and 10-24 rejected under 35 U.S.C. 103(a) as being unpatentable over Poncelet (US 6,468,492 B2), thus forth designated as US'646, in light of Pinnavaia (US Application Number 10/272,751), thus forth designated as US'272.

The instant claims detail the method for aluminosilicate production including the steps of treating a mixed aluminum and silicon alkoxide of which the silicon has

both hydrolysable, such as tetramethyl orthosilicate and tetraethyl orthosilicate, and non hydrolysable species, which can include structures such as methytriethoxysilane or vinyltriethoxysilane with an aqueous alkali, selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, diethylamine, and triethylamine in the presence of silanol groups, in the form of silica or glass beads having a diameter between .2 and 5mm, where the molar concentrations of components have to stay in the following ranges:

$$Al = 4.3e-2 < x < 3 \text{ mol/l}$$

$$Al/Si = 1 < x < 3.5$$

$$Alkali/Al = 2.3 < x < 3$$

This mixture is then subsequently stirred at ambient temperatures in the presence of silanol groups long enough to form the polymer, where another step can occur after this where the molar ratio of alkali/Al can be brought to 3 and finally undergoes a process where the byproducts of the reaction are eliminated from the medium. Finally a last step can occur where chelating groups are added to the product.

US'646 teaches a process similar to that of the instant claims in its specifications (See Example 1 of the Detailed Description of the Invention in conjunction with the claims) where a **hydrolyzable aluminum precursor** in the form of **aluminum chloride**, which is classified as both an aluminum salt and aluminum halide (*Relevant to Claims 1(a), 2 and 10-11 of the instant application*),

and a **hydrolysable silicon precursor** in the form of **tetramethyl orthosilicate** (*Relevant to Claims 1(a), and 10, 11 and 17 of the instant application*) were mixed in an **alkali** solution of **sodium hydroxide** (*Relevant to Claim 1(a) and 2 and 7-9 of the instant application*) in the presence of **glass beads** having a diameter of **2mm** (*Relevant to Claims 1(a and b) and 3-4 of the instant application*). The molar concentrations of components in this mixture are as follows:

**Al =  $5e-4 < x < 5e-2$  mol/l** (*Relevant to Claims 1(a) and 5-6 of the instant application*)

**Al/Si=1.4** (*Relevant to Claim 1(a) of the instant application*)

**Alkali/Al** before and during polymerization = **2.28** (*Relevant to Claims 1(a) and 7 of the instant application*)

**Alkali/Al** after polymerization = **2.98** (*Relevant to Claims 1(a) and 8-9 of the instant application*)

The initial mixture is stirred for three hours at an unrecited temperature. No heating is involved in this process, so the temperature is assumed to be that of room temperature. (*Relevant to Claim 1(b) of the instant application*). Followed by adding additional sodium hydroxide to bring the molar ratio of Alkali to Al to **3** (*Relevant to Claim 8 of the instant application*). The mixture is then stirred once again at room temperature. The composition was then treated with acetic acid, which is a chelating agent (*Relevant to Claim 18-20*). The composition is then ripened (a step which is unnecessary in light of example 2 of US'646) and

**ultrafiltered** through an Amicon 100K membrane, which removes residual ions from the polymer obtained in the preceding steps (*Relevant to Claim 1 (c) of the instant application*). In regards to the added limitation imposed by step C, the step is optional, and does not impose any limitation on the claims. Although Poncelet does indeed add extra alkali, as stated in his disclosure, the claims as amended still read on Poncelet, since an optional step is non-limiting.

The features of the invention not taught by US'656 are:

the use of a silicon compound having a **non-hydrolysable** substituent as a precursor. (Present in Claims 1 and 10-16)

the use of one or more **chelating agents** after the purification of the product. (Present in Claims 18-22)

The use of both of these methods is taught by US'272. This application teaches a silica or metal silicate, wherein aluminum is a possible metal, due to its inclusion as a possible hydrolysable precursor (See paragraph 41, line 3). US'272 then goes on to teach the formation of silica having both functional silanes (silicon alkoxide having a non-hydrolysable constituent) as well as standard hydrolysable alkoxides (See paragraph 43). This application lists a myriad of useful functional silanes, of which vinyltriethoxysilane (see paragraph 93) is among these (*Relevant specifically to Claim 1*

*and 14-16, but extensive to claims 1-22 due to dependancy*). The application states that compositions having both functional (silicon alkoxide having a non-hydrolysable constituent) and non-functional silicon precursors could be produced by “direct incorporation of an organosilane (silicon alkoxide having a non-hydrolysable constituent) during the assembly.” The ratio recited by US’272 is 3.3 moles of silicon having hydrolysable constituents for every mole of silicon having a non-hydrolysable constituent (*Relevant to Claim 12 of the instant application*). It would seem obvious to extend this ratio to incorporate more non-hydrolysable silicon in order to create a more functionalized surface. (*Relevant to Claim 13 of the instant application*).

There is significant motivation to combine these two inventions as stated in US’272 where it is revealed that functional organo groups on the silane moiety are useful in catalytic applications, sensing and linking applications, and also are especially useful as metal trapping agents (See Paragraph 48 and 106). The incorporation of silicon compounds having non-hydrolysable constituents is within the level of ordinary skill in the art, as the use of these constituents dates back to the late 90’s (See paragraph 0045 of US’272). Furthermore, an integral part of the art of aluminosilicate production is the incorporation of varying precursors in order to produce a product with specific characteristics, where these are based on pore size, density and surface characteristics (catalytic, hydrophobic, hydrophilic). The incorporation of such groups have far reaching effects on the engineering of surface characteristics of these products. Therefore, the incorporation of functional silicon precursors in the present invention seems to be an obvious modification of US’646 to one who is skilled in the art.



The use of chelating agents are seen in US'646, in the form of acetic acid, where this process occurred before purification. The fact that the chelating agents of the instant application are added post purification is irrelevant, since either route produces the same product with no unexpected results made of record. The process of filtration only removes byproducts such as ions from the composition. The "chelating" agents become a part of the composition and for this reason are not deemed to be impurities or byproducts. Poncelet also adds HCl to his composition, which based on the applicant's disclosure is a chelating agent for aluminum. It should be noted that the new 112 rejection points out that .For this reason it is equally advantageous to add these agents before or after filtration and would seem obvious to one skilled in the art to perform the process of US'646 by either means.

Application US'272 discloses that the surfaces of the composition can be further functionalized in order to produce catalytic, hydrophilic, or hydrophobic surfaces. It states that this can be accomplished by adding a number of different reacting species, most importantly alkylating reagents (see paragraph 108). An alkylating reagent would be any reactant that added alkyl groups to the composition, in this case to the Aluminum in the composition. US'272 goes on to state that this can be done after synthesis, as is the case as disclosed by the instant application. The combination of this procedure with that of US'646 seems obvious given the disclosure of the instant application states that "the functional group of the chelating agent allows to increase the affinity of the hybrid

Art Unit: 1793

aluminosilicate polymer with the medium in which it is used.” One measure of a material’s affinity to the medium in which it is used is that of its hydrophilicity. To alter this property alkylating reagents would need to be chosen based on their wetting ability, which would mean alkylating reagents other than acetic acid would be chosen to tailor the properties of the material. Furthermore, the concentration of such alkylating reagents is also a basis for wettability, and in this sense would also be seen as an obvious alteration, i.e. adding a greater concentration of wettable species leads to a more wettable composition. Since, US’272 expressly cites this procedure as a means to make the composition more hydrophilic or hydrophobic, this alteration to the procedure is deemed as obvious, and furthermore within the capabilities of one of ordinary skill in the art.

For the above reasons, the product of the process of Poncelet in view of Pinnavaia would also be anticipated. Since the process is anticipated, so is the resultant product (Relevant to Claim 23).

### ***Allowable Subject Matter***

3. Claim 24 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 24 discloses a specific material with a specific Raman spectrographic characterization. The prior art is silent as to a material having such properties.

### ***Claim Rejections - 35 USC § 101***

#### ***Double Patenting***

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-22 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/521348 in view of 10/272,751. The difference between the instant application and the claims of 10/521348 is the fact that the instant application uses both hydrolysable silicon precursors and silicon precursors with a non-hydrolysable constituent to make the final product, where 10/521348 uses only silicon precursors with hydrolysable constituents. The use of silicon with hydrolysable constituents is regarded as an obvious alteration to create a more functionalized surface. 10/272,751 teaches

that organosilicates (those with non-hydrolysable constituents) can be used in conjunction with other hydrolysable precursors, when making a silicate or a metal silicate, where Aluminum is expressly mentioned as the metallic species (See paragraph 41, line 3). Furthermore, vinyltrimethoxysilane (See paragraph 93) was expressly mentioned as a useful organosilicate in this process. There is a substantial amount of motivation to combine these inventions, since the incorporation of organically functional groups leads to a functional structure, which can be used as a sensor, catalyst or used to trap metal ions in solution (See Paragraph 48 and 106). The motivation for the combination of these functional groups seems even more obvious in light of the fact that the instant application, as well as the copending application, uses chelating agents to add a different type of functionality to the product. Adding another type of functionality through an organosilane is obvious and one of skill in the art would indeed see the benefit in such an alteration in composition design. This is a provisional obviousness-type double patenting rejection since the conflicting claims have not in fact been patented.

### ***Response to Arguments***

1. Applicant's arguments filed 12/20/2007 have been fully considered but they are not persuasive. The applicant argues on page 7 that the inclusion of the **optional** step of "optionally adding alkali to increase the alkali/Al molar ratio to 3 if required.... And then directly", precludes the heating step used by Poncelet. This is not the case due to the fact that this step is optional. Poncelet initially mixes the precursors at room

Art Unit: 1793

temperature, followed by a further mixing and aging step for 24 hours at 90 C. Although it is recognized that Poncelet does indeed add further NaOH to the solution, the claimed step is non-limiting. Therefore, the applicants argument that this limitation causes the claims to be novel over the prior art is unfounded. *The examiner believes that deleting the word "optionally" may better differentiate the current claim from the prior art.*

2. Bridging, pages 7 and 8, the applicant makes arguments directed towards the product of Poncelet in view of Pinnavaia as compared to that of the instant application.

These arguments are not persuasive, due to the fact that the claims at hand are directed towards a process. However, in making the initial rejection, the examiner unintentionally overlooked including claims 23-24 in the original 103 rejection.

Applicants arguments concerning the Raman spectrum of Poncelet as compared to that of the instant application are persuasive. The structure of the product do seem to be different thus leading to different Raman spectra. In light of this, claim 24 would be allowable if incorporated in the independent claim. Claim 23, only claims the product of the process of claim 1. The product of Poncelet in view of Pinnavaia is still a product, although different in structure, and is thus still made by this obvious combination.

3. The applicant's arguments bridging pages 8 and 9 are directed towards the selection of a silane precursor carrying only one non-hydrolyzable group. It is stated that Pinnavaia discloses a silane with up to three non-hydrolyzable groups. Indeed, the applicant is correct in asserting that only one non-hydrolyzable group is useful in the creation of modified aluminosilicates; however, although Pinnavaia does not point out an exact number of groups used, when this reference is used to modify Poncelet, one of

Art Unit: 1793

ordinary skill in the art would realize that three hydrolyzable groups are necessary to create a usefully modified aluminosilicate. Silane precursors having only one non-hydrolyzable group are indeed well known in the art and are preferred. Patent 5898089 mentions several silane bearing precursors having one non-hydrolyzable group in column 4, lines 33-55. The vast majority if not all of these species have only one non-hydrolyzable group. Therefore, it is well established that silane having one non-hydrolyzable moiety is well known, thus one of ordinary skill in the art would have used a precursor having only one hydrolyzable moiety, although Pinnavaia's disclosure states that the silane can have up to 3.

4. The applicant's arguments bridging pages 9 and 10 deal with the chelating and functionalizing of the aluminosilicate obtained. The use of HCL and acetic acid after purification does not give any unexpected results as compared to using the same "chelating" compounds prior to purification. These two substances, although added to precipitate the aluminosilicate would also be present on the surface of the aluminum as chelating reagents. Purification would not remove these chelated compounds. Furthermore, the applicant speaks of the examiners statements regarding surface modifying reagents used by Pinnavaia. It is realized that these are different from those claimed, and this example was only provided to show that surface modification of aluminosilicates in order to impart wettability and other functionality is rather routine. The functionality provided by the HCl and acetic acid of Poncelet is that which would be used in the combination of the two references.

5. Lastly, arguments directed towards the ODP rejection of claims 1-22 are unpersuasive. As stated in the previous office action, adding organically functionalized silane, such as those of Pinnavaia is well known in the art and is used to further functionalize the aluminosilicate for use in specific applications. One of ordinary skill would definitely be motivated to modify 10/521898 with the teachings of Pinnavaia to form a functional aluminosilicate that would be better suited for specific applications. Furthermore, as mentioned previously the use of non-hydrolyzable silicon moieties is well known and can be seen in other art such as that of Patent 5898089.

6. Applicant's arguments, see page 1 and 11-12, filed 12060/2007, with respect to the 112 rejection on claim 1 and the ODP rejection on claims 23-24 have been fully considered and are persuasive. These rejection of claims 1 and 23-24 has been withdrawn.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Hoban whose telephone number is (571) 270-3585. The examiner can normally be reached on Monday - Friday from 7:30 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Meh

/Jerry A Lorengo/  
Supervisory Patent Examiner, Art Unit 1793